AMENDMENTS TO THE CLAIMS:

Please amend claims 1 and 22 – 26, and add new claim 30 as follows. This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A method of manufacturing a semiconductor device comprising:

preparing a substrate to be treated; and

forming an insulation film above the substrate, which includes:

applying an insulation film raw material above the substrate, the insulation film raw material including a substance or a precursor of the substance, the insulation film comprising the substance[[,]]; and

curing the insulation film raw material by irradiating an electron beam on the substrate while heating the substrate at a first heating temperature and holding the first heating temperature constant in a reactor chamber, and causing to change temperature of the substrate from [[a]] the first heating temperature to a second heating temperature different from the first heating temperature and holding the second heating temperature constant during the electron beam irradiating process,

wherein the second heating temperature is lower than the first heating temperature.

2. (Previously Presented) A method of manufacturing a semiconductor device according to claim 20, wherein the pressure in the reactor chamber is changed in a range from higher than 0 Torr to not more than 40 Torr.

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3. (Original) A method of manufacturing a semiconductor device according to claim 1, wherein the temperature of the substrate is changed in a range from not less than 200°C to not more than 500°C.

4. (Previously Presented) A method of manufacturing a semiconductor device according to claim 20, wherein type of gas having the substrate exposed thereto is changed among a nitrogen gas, a rare gas, a reduced gas and a mixture of these gases, and whose oxygen concentration is not higher than 100 ppm.

5. (Previously Presented) A method of manufacturing a semiconductor device according to claim 20, wherein the flow rate of gas having the substrate exposed thereto, the gas being introduced into the reactor chamber, is changed in a range of from higher than 0 slm to not more than 25 slm.

6. (Previously Presented) A method of manufacturing a semiconductor device according to claim 20, wherein the position of the substrate is changed in a range from not less than 50 mm to not more than 120 mm in distance from an electron beam generating section that generates the electron beam.

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7. (Previously Presented) A method of manufacturing a semiconductor device according to claim 20, wherein the quantity of electrons incident to the substrate per unit time is changed in a range from not less than 4 $\mu C/cm^2 \cdot sec$ to not more than 10 $\mu C/cm^2 \cdot sec$.

8. (Previously Presented) A method of manufacturing a semiconductor device according to claim 1, further comprising:

at least one of pre-heat treatment which carried out before curing the insulation film raw material and post-heat treatment which carried out after curing the insulation film raw material in the reactor chamber, changing at least one of the parameters selected from the group consisting of pressure in the reactor chamber, temperature of the substrate, type of gas having the substrate exposed thereto, flow rate of gas introduced into the reactor chamber, and position of the substrate when the at least one of the pre-heat treatment and the post-heat treatment is being carried out.

9. (Original) A method of manufacturing a semiconductor device according to claim 8, wherein the pressure in the reactor chamber is changed in a range from higher than 0 Torr to not more than 40 Torr when the at least one of the pre-heat treatment and the post-heat treatment is being carried out.

10. (Original) A method of manufacturing a semiconductor device according to claim 8, wherein the temperature of the substrate is changed in a range from not less than 200°C to not more than 500°C when the at least one of the pre-heat treatment and the post-heat treatment is being carried out.

11. (Original) A method of manufacturing a semiconductor device according to claim 8, wherein type of gas having the substrate exposed is changed among a nitrogen gas, a rare gas,

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and a mixture these gases whose oxygen concentration is not higher than 100 ppm when the at least one of the pre-heat treatment and the post-heat treatment is being carried out.

12. (Original) A method of manufacturing a semiconductor device according to claim 8, wherein the flow rate of gas having the substrate exposed thereto, the gas being introduced into the reactor chamber, is changed in a range of from higher than 0 slm to not more than 25 slm when the at least one of the pre-heat treatment and the post-heat treatment is being carried out.

13. (Original) A method of manufacturing a semiconductor device according to claim 8, wherein the position of the substrate is changed in a range from not less than 50 mm to not more than 120 mm in distance from an electron beam generating section that generates the electron beam when the at least one of the pre-heat treatment and the post-heat treatment is being carried out.

14. (Original) A method of manufacturing a semiconductor device according to claim 1, wherein the insulation film is an organic silicon oxide film.

15. (Canceled)

16. (Original) A method of manufacturing a semiconductor device according to claim 1, wherein the insulation film is a polymethylsiloxane film.

17. (Canceled)

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18. (Original) A method of manufacturing a semiconductor device according to claim 1, further comprising: embedding a wire whose main material is Cu on a surface of the insulation film.

19. (Canceled)

20. (Previously Presented) A method of manufacturing a semiconductor device comprising:

preparing a substrate to be treated;

forming an insulation film above the substrate, which includes applying an insulation film raw material above the substrate, the insulation film raw material including a substance or a precursor of the substance, the insulation film comprising the substance, curing the insulation film raw material by irradiating an electron beam on the substrate while heating the substrate in a reactor chamber, and changing at least one of the parameters selected from the group consisting of pressure in the reactor chamber, type of gas having the substrate exposed thereto, flow rate of a gas introduced into the reactor chamber, position of the substrate, and quantity of electrons incident to the substrate per unit time when the electron beam is being irradiated on the substrate.

21. (Previously Presented) A method of manufacturing a semiconductor device according to claim 20, further comprising:

at least one of pre-heat treatment which carried out before curing the insulation film raw material and post-heat treatment which carried out after curing the insulation film raw material in

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the reactor chamber, changing at least one of the parameters selected from the group consisting of pressure in the reactor chamber, temperature of the substrate, type of gas having the substrate exposed thereto, flow rate of gas introduced into the reactor chamber, and position of the substrate when the at least one of the pre-heat treatment and the post-heat treatment is being carried out.

22. (Currently Amended) A method of manufacturing a semiconductor device according to claim [[20]] 21, wherein the pressure in the reactor chamber is changed in a range from higher than 0 Torr to not more than 40 Torr when the at least one of the pre-heat treatment and the post-heat treatment is being carried out.

23. (Currently Amended) A method of manufacturing a semiconductor device according to claim [[20]] 21, wherein the temperature of the substrate is changed in a range from not less than 200°C to not more than 500°C when the at least one of the pre-heat treatment and the post-heat treatment is being carried out.

24. (Currently Amended) A method of manufacturing a semiconductor device according to claim [[20]] 21, wherein type of gas having the substrate exposed is changed among a nitrogen gas, a rare gas, and a mixture these gases whose oxygen concentration is not higher than 100 ppm when the at least one of the pre-heat treatment and the post-heat treatment is being carried out.

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25. (Currently Amended) A method of manufacturing a semiconductor device according to claim [[20]] 21, wherein the flow rate of gas having the substrate exposed thereto, the gas being introduced into the reactor chamber, is changed in a range of from higher than 0 slm to not more than 25 slm when the at least one of the pre-heat treatment and the post-heat treatment is being carried out.

26. (Currently Amended) A method of manufacturing a semiconductor device according to claim [[20]] 21, wherein the position of the substrate is changed in a range from not less than 50 mm to not more than 120 mm in distance from an electron beam generating section that generates the electron beam when the at least one of the pre-heat treatment and the post-heat treatment is being carried out.

27. (Previously Presented) A method of manufacturing a semiconductor device according to claim 20, wherein the insulation film is an organic silicon oxide film.

28. (Previously Presented) A method of manufacturing a semiconductor device according to claim 20, wherein the insulation film is a polymethylsiloxane film.

29. (Previously Presented) A method of manufacturing a semiconductor device according to claim 20, further comprising: embedding a wire whose main material is Cu on a surface of the insulation film.

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30. (New) A method of manufacturing a semiconductor device comprising:

preparing a substrate to be treated; and

forming an insulation film above the substrate, which includes:

applying an insulation film raw material above the substrate, the insulation film raw material including a substance or a precursor of the substance, the insulation film comprising the substance;

heating the substrate to a first heating temperature and holding the first heating temperature constant; and

curing the insulation film raw material by irradiating an electron beam on the substrate while heating the substrate at a second heating temperature different from the first heating temperature in a reactor chamber and holding the second heating temperature constant, and changing temperature of the substrate from the second heating temperature to a third heating temperature different from the second heating temperature and holding the third heating temperature constant during the electron beam irradiating process,

wherein the third heating temperature is lower than the second heating temperature.

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